Athos Oil Spill
Comments on Bird and Wildlife Injury Assessment
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Overview

The draft report of the bird and wildlife injury assessment is a robust document describing the response activities, data collection and estimates of injury to birds and mammals affected by the spill during the period November 26, 2004 to January 21, 2005. The report describes the procedures followed to quantify the number of birds and mammals present and at risk in the spill area, and procedures to quantify the percentages of birds observed oiled.

Quantification of injury to birds

Because of the difficult ground access to much of the spill area, a combination of aerial and ground surveys were conducted to evaluate the injury to wildlife. The report describes in detail the process used to calculate the numbers of oil exposed birds and the Excel table developed to quantify the injury. The approach for surveys and the adjustments made by the Trustees for visibility appear to be appropriate and conservative in an effort to calculate the numbers of birds present and exposed to oil during surveys.

The descriptors of trace, light, moderate and heavy oiling are satisfactory for field evaluations, and the mortality estimates from the different classes of oiling (Table 7) appear reasonable, based on my experience. Gulls and geese are much more able to survive light oiling than birds that spend a higher percentage of time in the water. The study of Fry and Lowenstein (1985) demonstrates that seabirds exposed to as little as 3-5 ml of crude oil frequently may die from hypothermia.

The risk-based assessment approach used in quantifying injury to birds is very appropriate, because of the difficulty in using ground searches to locate and enumerate oiled birds in much of the spill zone.

The maps and tables of ground surveys indicate that all areas, both oiled and unoiled, were adequately surveyed, and that oiled areas were not surveyed with greater frequency or intensity than unoiled areas. I believe the process used, and the qualified personnel employed were superior to most spills. Comments were made that some inexperienced observers were included in the search teams. If the inexperienced persons were employed to take notes or record data, I believe it was entirely appropriate to employ them. If an experienced observer was a member of each field team, I would consider the data to be reliable.

The explanations provided by the Trustees for selecting the risk-based approach rather than alternative evaluation methods are clear and convincing. The uncertainty in using a single multiplier for the number of birds oiled based on the number recovered would, in my opinion, be much greater than the carefully designed and conducted suite of ground and aerial surveys enumerating all birds and the proportion of oiled birds in separate

areas of the spill. I agree with the statement that many oiled birds would have hidden themselves in the marshes, and would have not been discovered by searchers. This would confound efforts to determine an appropriate multiplier for calculation of injury.

The alternative method of modeling based on distribution of oil and distribution of birds would have been very difficult in this spill, because of the complex shoreline geography and continuous tidal movements of oil. The repeated complete aerial survey coverage and extensive ground evaluations appear to provide a much more complete assessment and much less uncertainty than could be accomplished with modeling as conducted in many previous spills.

Calculation of foregone reproduction

Breeding failure of oil exposed birds is a well demonstrated fact. Fry et al (1986) demonstrated that exposure of shearwaters to as little as 0.1 ml of weathered crude oil prior to the breeding season caused abandonment of many birds, as well as breeding failure of those birds attempting to breed. Exposure to 2 ml of oil resulted in 100% breeding failure in the year of exposure, and to reduced breeding in the subsequent year. (Fry, et al 1985). I believe the assumption that oiled birds would lose one year of breeding is conservative and defensible, and I agree with the indirect injury calculations resulting from this assumption.

The draft report originally used 50% of the lifespan of surrogate species as the length of time foregone production was calculated. This was reduced in the current draft to 33% of the lifespan. I believe a more defensible period would be the average expected life expectancy of the population, based on a life history table or published literature of distribution of ages of birds within particular populations. I believe arbitrarily selecting 1/3 of the lifespan is severely underestimating the reproductive potential of birds killed. The age of first breeding of Ring-billed gulls is usually 4 years, for birds having a maximum lifespan of 27 years. The most productive breeding birds are the oldest birds in the population, as demonstrated by fledging success of chicks. Having a cut-off age of 9 years provides for only 5 of a possible 22 years of breeding, which is unrealistically short. Similarly, Canada geese reproductive success increases with age, and having a cut-off at 1/3 of the lifespan seems too short. I recommend using a calculated average life expectancy, or, if that is not able to be calculated, 50% of maximum lifespan.

Density dependent population dynamics

Much of the criticism of the Trustee's report focused on presumed accelerated recovery of populations, because of possible density dependent factors allowing more productive breeding when populations of birds are depressed. The concept of density dependent population dynamics has been poorly studied in bird species, but recent work by Saether and his colleagues in Europe (2005) has analyzed 23 species of birds to determine whether such population dynamics exist for birds. Their conclusion is: "These results indicate that the relationships between demographic and life-history traits in birds translate into distinct population dynamical patterns that are apparent **only on a scale of generations**" (my emphasis added). Two generations for gulls would be about 10 years.

I believe the data indicate that density dependence would not be a factor for oil spill affected birds on the scale of recovery being discussed in this report.

Additionally, I believe that it is not appropriate to discuss density dependant population recovery for many migratory bird species impacted on their winter habitat unless additional information is available. The concept of density dependence applies most strongly to breeding colony or breeding territory dynamics, and these are not at issue in this spill. When a local area is impacted, but the birds fly many miles (often thousands of miles) to a breeding area also populated by segments of the population not affected by the spill, density dependence at the breeding colony may not be observed. Factors such as fidelity to wintering grounds and local weather conditions make evaluation of recovery very complex. In my opinion, using fish as an example for breeding birds is not appropriate.

Exclusion of the resident population of Canada Geese from recovery calculations

Canada geese and gulls are protected migratory species regardless of their population dynamics in human influenced environments. All protected bird species should be included in the damage assessment, regardless of their breeding locality or behavior in man-altered habitats. Under circumstances where there is permitted management activity to take resident Canada geese, the exclusion of resident geese from the indirect injury calculations would seem reasonable.

Miscellaneous issues

Ruddy turnstones are included under the heading “Raptors” in Table 3. They should only be included under the heading “Shorebirds”

The heading “Passerines” in Table 3 includes species that are not passerines. I suggest the heading be changed to “Landbirds”, and wild turkeys should be included under this heading.

References

Fry, D.M., J. Swenson, L.A. Addiego, C.R. Grau, and A. Kang. 1986. Reduced reproduction of wedge-tailed shearwaters exposed to single doses of weathered Santa Barbara crude oil. *Archives of Environmental Contamination and Toxicology* 15:453-463.

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